ATARI LOGO

A PROPOSED PLAN

BY

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PILOT

Programmed Inquiry Learning Or Teaching

PURPOSE

Created to fill need for a programming language for educators which would not require having an extensive mathematical background.

HISTORY

Developed by Dr. John Starkweather at the University of California Medical Center in San Francisco.

FEATURES

- Easy to learn
- Designed for educational applications
- Minimum number of commands

PRIMARY USE

Authoring system used to develop Computer-assisted instruction coursewares.

ATARI PILOT

ENHANCEMENTS

- Superset of core Pilot
- Easy access to graphics & sound
- Interactive
- Specialized commands
- Designed as an introductory language
- Turtle Graphics

SAMPLE PILOT PROGRAM

Figure 6-6 shows how you can use a numeric condition to limit a person to three guesses in a guessing game.

```
10 R:WHAT AM I?
20 T:WELCOME TO ''WHAT AM I?''
30 T:I'LL GIVE YOU 3 HINTS \
40 T:TO GUESS WHAT I AM . . .
50 PA:60
60 T:
70 T:ARE YOU READY? \
80 A:
90 T:
100 M:  Y,SURE,OK,FINE,ALRIGHT
110 JN:*GOODBYE
120 C:#G=1
130 *LOOP
140 T(#G=1) :I ROLL ALONG, BUT I DO
NOT HAVE WHEELS.
150 T(#G=2) :I HAVE A MOUTH, BUT I
CANNOT SPEAK.
160 T(#G=3) :I HAVE A BED, BUT I
NEVER SLEEP.
170 T:WHAT AM I?
180 T:
190 A:$ANSWER
200 M:RIVER,STREAM,CREEK
210 JY:*RIGHT
220 J(#G=3) :*NOMORE
230 T:NOPE, GUESS AGAIN.
240 T:
250 C:#G=#G+1
260 J:*LOOP
270 *NOMORE
280 T:
290 T:NOPE, THAT'S THREE GUESSES.
300 T:I AM A RIVER.
310 J:*GOODBYE
320 *RIGHT
330 T:
340 T:THAT'S CORRECT! I AM
$ANSWER.
350 *GOODBYE
360 T:
370 PA:60
380 T:SEE YOU LATER.
390 E:

READY
■
```

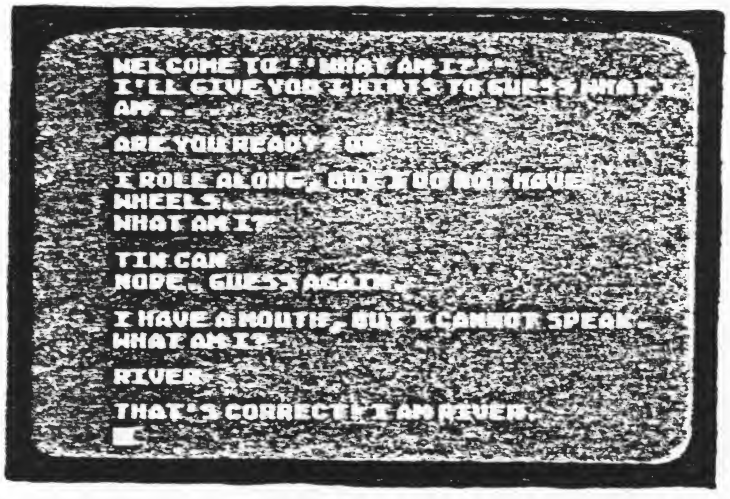


Figure 6-6

PASCAL

PURPOSE

Structured programming language created to facilitate the teaching of a systematic approach to computer programming and problem solving.

HISTORY

Created by Niklaus Wirth.

FEATURES

- Allows for modular program design
- Data structures and manipulation
- Aritmetic operations
- Recursive procedures
- File manipulation
- Procedure, functions and program declarations
- Control statements
- Compiled Language

PRIMARY USE

High Level Development Language for serious programmers.

Teaching of Computer Science Curriculum.

```
(* AS OF 10/21/79 *)
```

SAMPLE PASCAL PROGRAM

```
PROGRAM CALCULATE;

CONST
  RCONST = -2.5;
  RCONST1= 65535.5;

VAR R1,R2,TEMP:REAL;
    X : ARRAY [1..2] OF REAL;
    CH1,OP:CHAR;

(*$ID1:STDPROCS*)

FUNCTION SUBREAL(R1,R2:REAL) : REAL;

BEGIN
  SUBREAL := R1 - R2
END;



PROCEDURE ADDREAL(VAR R1:REAL; R2:REAL);
BEGIN
  R1 := R1  +  R2
END;

PROCEDURE TF(B:BOOLEAN);
BEGIN
  IF B THEN
    WRITELN('TRUE')
  ELSE
    WRITELN('FALSE')
END;

PROCEDURE CALC;
BEGIN
    CASE OP OF
      'S': BEGIN
             INLINE($FD/$09);
             WRITELN(SIN(R1));
           END;
      'C': WRITELN(COS(R1));
      'A': WRITELN(ARCTAN(R1));
      'L': WRITELN(LN(R1));
      'E': WRITELN(EXP(R1));
      '+': BEGIN ADDREAL(X[1],X[2]); WRITELN(X[1]:10:3) END;
      '-': WRITELN(SUBREAL(X[1],X[2]):10:2);
      '*': WRITELN(R1 * R2);
      '/': WRITELN(R1 / R2);
      'M': WRITELN(-R1);
      '=': TF(R1 = R2);
      'N': TF(R1 <> R2);
      '$': WRITELN(SQRT(R1):10:3,SQRT(R2):10:3);
      '<': TF(R1 < R2);
      '>': TF(R1 > R2);
      'Z': TF(R1 <= R2);
      'G': TF(R1 >=R2);
      '1': WRITELN(SQR(R1),' ',SQR(R2));
      '2': WRITELN(R1 + 1);
      '3': WRITELN(1+R1);
      '4': WRITELN(TRUNC(R1));
      '5': WRITELN(ROUND(R1));
```

```
        '6': WRITELN(RCONST);
        '7': WRITELN(RCONST1);
        '8': BEGIN R1 := -2.234; X[1] := 3.456; WRITELN(R1,' ',X[1]); END;

      END;
END; (* CALCULATOR *)

PROCEDURE MENU;
BEGIN
        WRITE('S:SIN    ');
        WRITE('C:COS    ');
        WRITE('A:ARCTAN    ');
        WRITE('L:LN    ');
        WRITE('E:EXP    ');
        WRITE('1:SQR    ');
        WRITELN('$:SQRT   ');
        WRITELN('+, -, *, / ARITHMETIC OPERATORS');
        WRITELN('M:NEGATE');
        WRITE('= : EQUAL    ');
        WRITELN('N : NOT EQUAL');
        WRITE('<:LESS THAN    ');
        WRITELN('>:GREATER THAN ');
        WRITELN('Z:LESS THAN OR EQUAL TO');
        WRITELN('G:GREATER THAN OR EQUAL TO');
        WRITE('4:TRUNC    ');
        WRITELN('5:ROUND');
END;

BEGIN (* MAIN PROGRAM *)
  REPEAT
    WRITE('ENTER FIRST OPERAND? ');
    READ(R1);
    X[1] := R1;
    WRITELN('R1=',R1); WRITELN;
    WRITE('ENTER SECOND OPERAND? ');
    READ(R2);
    X[2] := R2;
    WRITELN('R2=',R2); WRITELN;
    WRITELN('ENTER OPERATOR:');
    MENU;
    WRITE('? ');
    READ(OP);
    WRITELN;
    CALC;
    WRITELN('TYPE <ESCAPE> TO STOP');
    READ(CH1);
  UNTIL CH1 = CHR(27)
END.
```

LOGO

PURPOSE

Developed as a learning language designed particularly for problem solving.

HISTORY

Dialect of LISP* developed under the direction of Seymour Papert at MIT.

FEATURES

- Procedure oriented
- Interactive
- List processing language
- Recursive
- Turtle Graphics
- User-Friendly
- No threshold/ no ceiling
- Extensible (Create command words)

LOGO — CON'T

PRIMARY USE

Serious language for learning.

Used to study natural language.

Used for studying associative thought processes and high level problem solving.

* LISP — Developed for use in artificial intelligence research.

LOGO EXAMPLE

By

Brian Harvey

```
TO PIGLATIN :SENT
IF EMPTYP :SENT [OUTPUT  []]
OUTPUT SENTENCE PLWORD FIRST :SENT
     PIGLATIN BUTFIRST :SENT
END

TO PLWORD :WORD
IF MEMBERP FIRST :WORD "AEIOUY [OUTPUT WORD :WORD "AY]
OUTPUT PLWORD WORD BUTFIRST :WORD FIRST :WORD
END

PRINT PIGLATIN [WE CAN SPEAK PIG LATIN]
```

EWAY ANCAY EAKSPAY IGPAY ATINLAY

COMPETITIVE PRODUCTS

TI LOGO

- Available from Texas Instruments
- Requires the basic TI 99/4A console plus extended memory and the TI LOGO command module
- Suggested retail for minimum system just under $1,000.

MIT LOGO FOR THE APPLE II

- Available from Terrapin, Inc. $149.95
- Requires 48K, disk drive with 16 sector controller, language card ... complete system around $2,400.

MIT LOGO FOR THE APPLE II

- Available from Krell Software $179.95
- Requires 48K, disk drive with 16 sector controller, language card ... complete system around $2,400.

COMPETITIVE PRODUCTS

LCSI LOGO PRODUCTS

AVAILABLE

APPLE LOGO (APPLE II)
(2nd best selling product for Apple)

- Distributed exclusively by Apple, Inc.
- Requires 48K, disk drive with 16 sector controller, language card ... complete system around $2,400.
- Retail price $175.

FUTURE IMPLEMENTATIONS

- Thompson
- Sinclair
- NABU
- IBM
- Atari Logo
- Others

ATARI LOGO (PROPOSED)

CONFIGURATION

Atari 400 with 16K

Optional:
Atari Disk Drive

PACKAGE CONTENTS

Consumer Product

Product 1-

16K Cartridge
plus documentation.

Educational Products

Product 2-

16K Cartridge
only.

Product 3-

documentation
only.

International Products
(Future)

English (British)

French

German

Spanish

Features

Functionally compatible to Apple Logo ... minor differences.

PRICE

Under $100.

ATARI LOGO ENHANCEMENTS

MINIMUM ENHANCEMENTS

Visible Turtle

DESIRED ENHANCEMENTS (Not Prioritized)

- Interface to Atari Disk Operating System
- Player Missile Graphics
- Collision Detection
- Color Map Modifications
- Sound
- Joystick/Paddle
- Serial I/O
- RS232 Interface
- Robot Interface

STRATEGIC EVALUATION

Rating	Criterion
Excellent	Adheres to corporate and divisional goals
Excellent	Enhances ATARI image in the marketplace
Excellent	Compares favorably with other media treatments - Only Logo available for 16K machine
Good	Showcases hardware capabilities - Atari specific features included
Excellent	Addresses a currently targeted market segment - Consumer and educational market for learning/education products
Excellent	Function is appropriate to the product line - Essential to educational/consumer marketing
Excellent	Function is new to product line or an improvement over existing products - New to product line
Excellent	Encourages ATARI hardware sales - Essential to meet bids for hardware sales to schools and increase hardware sales to consumers
Good	Encourages purchase of other ATARI software - Friendliness and quality of Atari Logo expected to encourage other Atari software purchases
None	Improves usefulness of other Atari software

CONSUMER PROFILE

Atari Logo is a programming language which is both easy enough for very young beginners (5 years old) and powerful enough to interest advanced programmers (has been used with MIT physics students).

Atari Logo is designed as a learning language: the user can start with easily understood features of the language and progress smoothly to more advanced features. For this reason it will appeal to home users of all ages as well as to educational institutions.

Logo is now in strong demand in schools because of its history as an MIT research development in the tradition of Jean Piaget, the influential developmental psychologist.

DISTRIBUTION

ATARI LOGO — PRODUCTED AND OWNED BY LOGO COMPUTER SYSTEMS, INC. EXCLUSIVE WORLD—WIDE DISTRIBUTION BY ATARI.

ATARI LOGO FORECAST

Expected Sales

	1983	1984	1985
Education	5,000	10,000	15,000
Consumer	52,000	157,500	--
International	4,600	--	--
Total	62,100	167,500	--

ESTIMATED MATERIAL COST

16K Cartridge	9.50
Quick Reference Card	.25
Introduction to Programming Guide (175 pages)	2.00
Logo Reference Manual	2.00
New Carton (2 @.35)	.70
Packing & Handling	.45

Total Est. Material Cost	14.70
16% Material Cost	2.35
Est. Preliminary Standard Cost	17.05

THE ORCHESTRA

Conducted by:

Bonnie Umphreys

Developed by:

Logo Computer Systems, Inc.

Technical assistance by:

Brian Harvey
Jim Dunion/Harry Stewart
Cynthia Solomon
Bob Kahn

Alpha testing by:

Brian Harvey
Cynthia Solomon

Beta testing by:

Capital Children's Museum

New York City School of the Future

Phoenix School in Cambridge

Santa Clara School District

Harold Abelson - Professor MIT

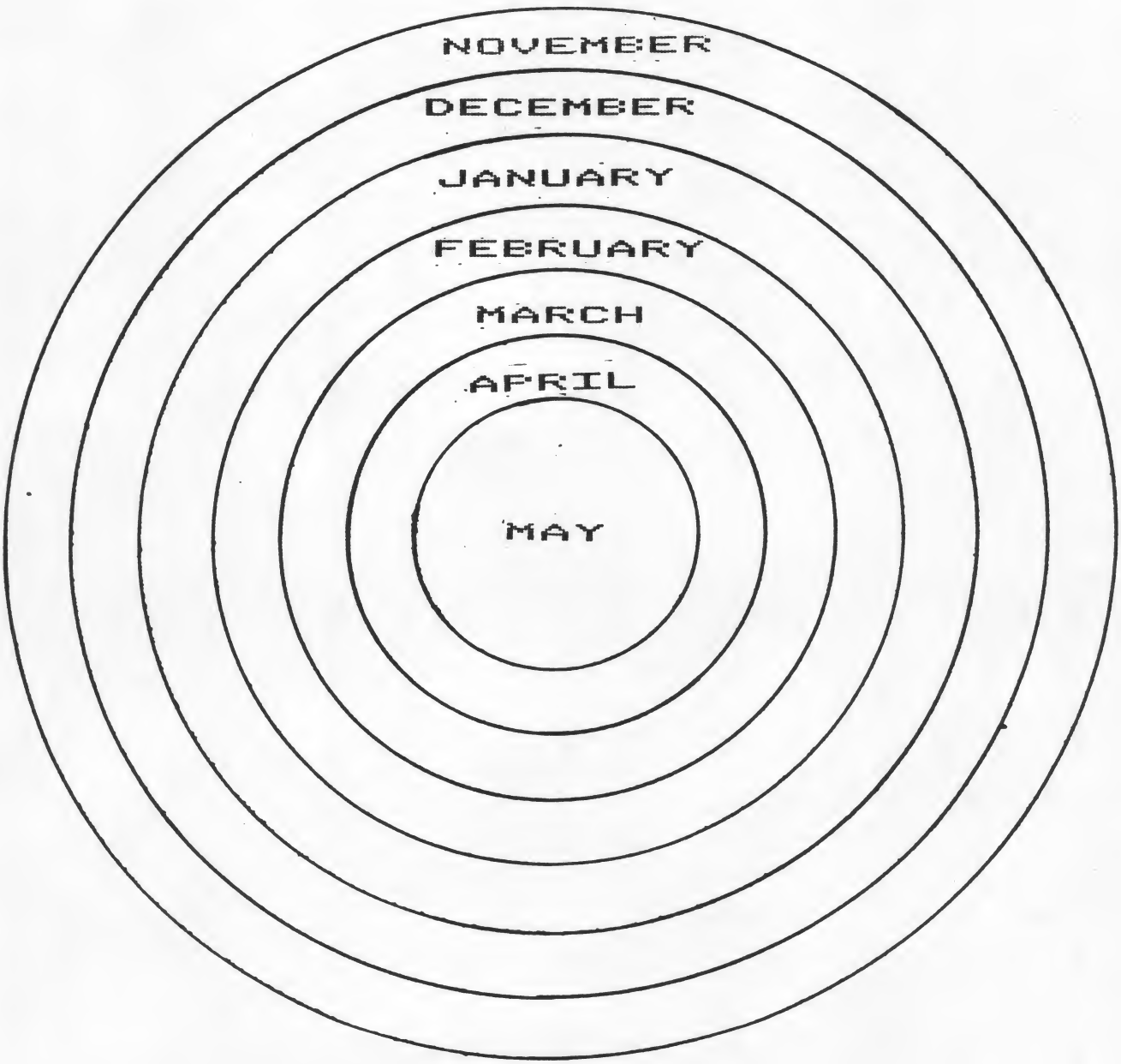
Manufacturing by:

Cartridge - Atari
Documentation & box - Atari or LCSI

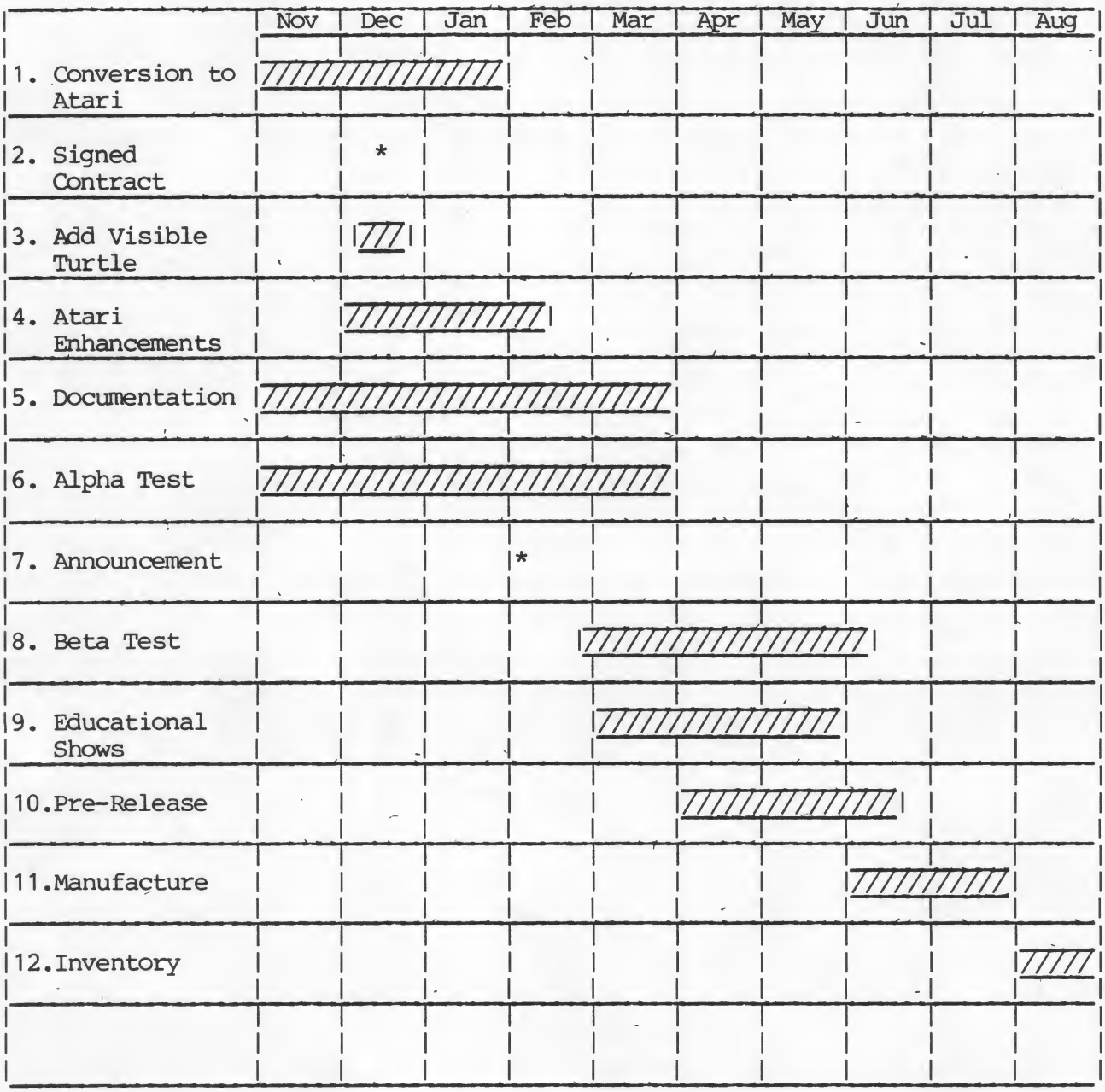
Exclusive World-Wide Distibution by:

Atari, Inc.

THE TARGET



THE SCHEDULE



LOGO'S ROOTS

JEAN PIAGET

1. Intellectual development requires a rich social environment.

2. A key part of development is the invention by each child of certain powerful ideas (e.g., conservation) which are abstracted from exploration of the environment.

LOGO'S ROOTS

ARTIFICIAL INTELLIGENCE

1. Computers can be used not only to process numeric data, but also to manipulate symbolic information.

2. The most interesting applications of computers include high-level problem solving (e.g., playing chess) and the understanding of human (natural) language.

3. These applications require programming languages which provide advanced control structures (recursive procedures) and data structures (list processing).

4. "Teaching" a computer to solve a problem can shed light on how human beings solve similar problems.

ENGLISH LANGUAGE PROCESSING

Data Hierarchy: letter - word - sentence.

Primitive procedures to analyze linguistic units:

FIRST

```
FIRST [THIS IS A SENTENCE]    "THIS
FIRST "HELLO                  "H
```

BUTFIRST

```
BUTFIRST [I LIKE COMPUTERS]   [LIKE COMPUTERS]
BUTFIRST "BANANA              "ANANA
```

LAST

```
LAST [LOGO IS FUN]            "FUN
LAST "AARDVARK                "K
```

BUTLAST

```
BUTLAST [E.T. PHONE HOME]     [E.T. PHONE]
BUTLAST "ZYLON                "ZYLO
```

```
TO SECOND :THING
OUTPUT FIRST BUTFIRST :THING
END

PRINT SECOND [THIS IS A LONG SENTENCE]
IS

PRINT SECOND "HELLO
E
```

POWERFUL IDEAS

FUNCTION

COMPOSITION OF FUNCTIONS

```
TO PIGLATIN :SENT
IF EMPTYP :SENT [OUTPUT  []]
OUTPUT SENTENCE PLWORD FIRST :SENT
     PIGLATIN BUTFIRST :SENT
END

TO PLWORD :WORD
IF MEMBERP FIRST :WORD "AEIOUY [OUTPUT WORD :WORD "AY]
OUTPUT PLWORD WORD BUTFIRST :WORD FIRST :WORD
END

PRINT PIGLATIN [WE CAN SPEAK PIG LATIN]

EWAY ANCAY EAKSPAY IGPAY ATINLAY
```

POWERFUL IDEAS

FUNCTION

COMPOSITION OF FUNCTIONS

MODULARITY

RECURSION

SUBPROCEDURE